

WHAT IS CLAIMED IS:

1. A facilitated transport membrane for separation of alkene hydrocarbons from hydrocarbon mixtures, comprising a porous supported membrane and a solid polymer electrolyte layer consisting of a transition metal salt and a polymer having double carbon bonds.
2. The facilitated transport membrane according to Claim 1, wherein a cation of the transition metal salt has the electronegativity of 1.8~2.3.3. The facilitated transport membrane according to Claim 2, wherein the transition metal is one selected from the group consisting of Mn, Fe, Co, Ni, Cu, Mo, Tc, Ru, Rh, Pd, Ag, Re, Os, Ir, Pt and complexes thereof.
4. The facilitated transport membrane according to Claim 1, wherein the transition metal salt has a lattice energy of 2500 kJ/mol or less.
5. The facilitated transport membrane according to Claim 4, wherein an anion of the transition metal salt is one selected from the group consisting of F^- , Cl^- , Br^- , I^- , CN^- , NO_3^- , SCN^- , ClO_4^- , CF_3SO_3^- , BF_4^- , AsF_6^- , PF_6^- , SbF_6^- , AlCl_4^- , $\text{N}(\text{SO}_2\text{CF}_3)_2^-$ and $\text{C}(\text{SO}_2\text{CF}_3)_3^-$.
6. The facilitated transport membrane according to Claim 1, wherein the transition metal salt includes a complex salt of the transition metal or a mixture of the salts of the transition metal.

7. The facilitated transport membrane according to Claim 1, wherein the polymer is one selected from the group consisting of polytrimethylsilylpropane, polystyrene, poly(tert-butyl)propane, polyisopropylpropane, polybutadiene, polyisoprene, polynorbornene, polyhexamethylene vinylene, polypynene and physical mixtures thereof.
8. The facilitated transport membrane according to Claim 1, wherein the porous supported membrane is a porous polymer membrane or ceramic membrane used in the preparation of a conventional composite membrane.
9. The facilitated transport membrane according to Claim 1, wherein the hydrocarbon mixtures to be separated contain at least one alkene hydrocarbon and at least one alkane hydrocarbon or an inert air.
10. The facilitated transport membrane according to Claim 9, wherein the alkene hydrocarbon is one selected from the group consisting of ethylene, propylene, butylene, 1,3-butadiene, isobutylene and mixtures thereof, the alkane hydrocarbon is one selected from the group consisting of methane, ethane, propane, butane, isobutane and mixtures thereof, and the inert air is one selected from the group consisting of oxygen, nitrogen, carbon dioxide, carbon monoxide, water and mixtures thereof.